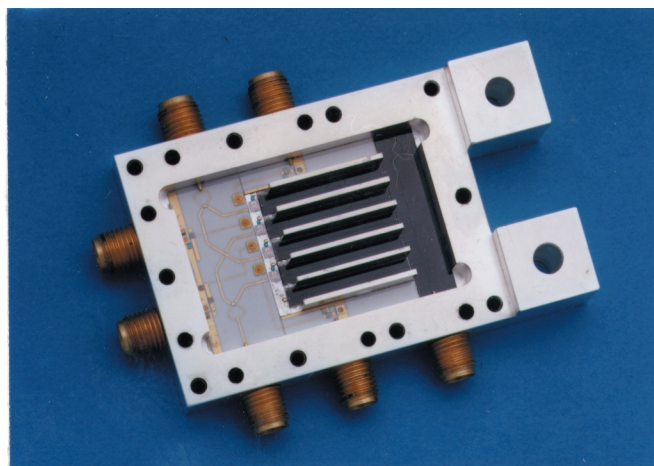
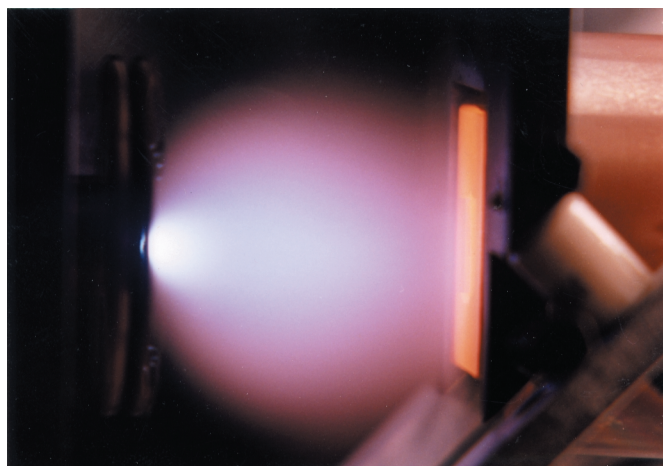


PULSED LASER DEPOSITION OF ELECTRONIC CERAMIC FILMS



Thin film electronic ceramics will play a prominent role in the next generation of electronic devices. Pulsed laser deposition (PLD) is an exciting new physical vapor deposition technique which has solved many of the problems associated with the growth of high quality ceramic thin films. PLD has demonstrated the ability to rapidly deposit epitaxial quality thin films with an extremely low defect density. At NRL, this technique has been applied to a broad spectrum of electronic ceramic systems to meet specific device application needs. For example:

<u>Electronic Ceramic Material</u>	<u>Application Area</u>	<u>PLD Material/Device Advance</u>
High T_c Superconductors	High Q Microwave Filters and Resonators	High T_c , J_c ; Low R_s Films
Ferroelectrics	NVRAMS, DRAMS, Optoelectronics, MEMS	Epitaxial, Low Loss Tangent, High Tunability Films
Ferrites	Circulators, Filters, Magnetic Recording	Low Loss, Thick Films (100 μm) on Semiconducting Substrates
Giant Magnetoresistance	Recording Heads, Magnetic Sensors	Extremely Large $\Delta R/R$, Phase and Temperature Optimized

The Naval Research Laboratory PLD Facility has several deposition chambers allowing thin films of electronic ceramics to be deposited as multilayers or superlattices, using a computer controlled target carousel, and over wafers up to 4" in diameter. In addition, sophisticated analysis techniques are employed to characterize film phase, structure, and morphology (e.g., X-Ray Diffraction, Rutherford Backscattering, SEM, TEM) and film specific properties (e.g., Resistance, Polarization, Magnetization, and Optical).

Points of Contact

Naval Research Laboratory
4555 Overlook Avenue, SW • Washington, DC 20375-5320

Catherine M. Cotell, Ph.D • Head, Technology Transfer Office • (202) 767-7230
Douglas B. Chrisey • Head, Plasma Processing Section • (202) 767-4788